

presumably it was human), and that it is impossible to arrive by mere ocular inspection at any conclusions whether an Anopheline has had a meal a few days previously. The data are as follows :—

	Native Houses and Cattle Sheds.			Coolie Lines.			Servants' Quarters.		
	Males.	Females.	Replete Females.	Males.	Females.	Replete Females.	Males.	Females.	Replete Females.
<i>A. vagus</i>	26	57	26	966	2,419	2,045	538	830	426
<i>A. subpictus</i> var. <i>malayensis</i>	—	1	1	—	39	46	—	17	14
<i>A. maculatus</i>	—	2	2	7	7	7	6	6	9
<i>A. karwari</i>	—	—	—	1	1	1	5	16	19
<i>A. hyrcanus</i>	25	29	15	4	58	28	45	126	54
<i>A. barbirostris</i>	2	5	4	5	10	3	40	153	55
<i>A. aconitus</i>	2,149	1,294	775	165	292	233	227	1,626	1,175
<i>A. kochi</i>	29	7	2	29	7	14	29	7	2
<i>A. fuliginosus</i>	33	4	4	33	4	4	33	71	36
<i>A. umbrosus</i>	21	2	1	21	2	1	21	254	59
<i>A. tessellatus</i>	3	74	44	3	74	41	3	38	25

From the foregoing data it will be noted that there was a preponderance of *A. aconitus* in collections from the kampong (village), and from the servants' quarters near the house of a European, whereas in the collections from the coolie lines *A. vagus* was by far the most dominant species. This is explicable as to the kampong and coolie line collections by the proximity of breeding-places favourable to the two species. Near the former is a swamp from which were taken in the course of the year 13,091 Anopheline larvae, among which were no fewer than 6,381 larvae of *A. aconitus*; near the latter was low-lying ground under cultivation for sugar-cane and vegetables, and in the foul water between the furrows the larvae of *A. vagus* could almost always be obtained in abundance. The source of the Anophelines obtained at the house of the European was not determined as to *A. aconitus*; the other dominant species probably came mostly from a fish-pond at no great distance.

The Habits of Larvae.

In a previous paper ("The Nature and Functions of the Caudal Tufts of Anopheline Larvae," Bull. Ent. Res., xii, p. 91) a description was given of the caudal hooklets wherewith the larvae of Anophelines are able to attach themselves to objects. In moving water it is probable that all species may employ these hooks to an equal degree to avoid being swept away. But there is a marked difference in habit between those larvae that are more usually found in moving water (though sometimes in still water) and those invariably found in stagnant water. The former, of which *A. maculatus* and *A. karwari* may be taken as types, invariably attach themselves to the nearest object; the latter, for example *A. kochi* and *A. vagus*, do not seek supports to anything like the same extent. When bowls containing examples of each were placed side by side, it was at once noticed that, whereas every single *A. maculatus* larva rested at right angles to its support, many of the larvae of *A. vagus* floated quietly, well out towards the centre, entirely unsupported and in this approximating to various Culicid larvae, for example, *Stegomyia albopicta*, which, owing perhaps in part to their having no means of attachment, are never found in moving water.

It is a little surprising that Anopheline larvae favouring stagnant water have any development of caudal hooks. The writer, speculating as to their presence in such larvae, had concluded that they might be evidence of an alteration of breeding habit,

such species having, perhaps, bred in running water before there were large numbers of small open pools available. But Dr. J. W. Scott Macfie has suggested a more probable explanation: that such larvae may use their hooks to prevent themselves being driven before the wind.

Such differences of habit may well have important practical bearings, as is suggested by the following observation in regard to *Stegomyia*. A considerable number of larvae of *S. albopicta* were found in water that had collected in an old iron pan under shelter. On the surface of this was poured a mixture of heavy oil (Mobil-oil A) and kerosene, and a complete film being formed, the larvae all perished. A few days later the film of oil was found to be no longer complete, for the volatile constituents had evaporated, and the residual globules had run together into masses which had collected largely at the sides. In the spaces free from oil young larvae of *Stegomyia*, which must have originated from eggs most carefully disposed by the female parent, were found. These thrived and increased in size, though the fact of their ultimate pupation was not ascertained. The presence of the larvae, indicating their instinct and ability to keep free from a broken film of oil, suggests the high importance of an investigation as to the relative fate, under such conditions, of species such as *A. maculatus*, with a strong tendency to attach itself to supports (round which globules of oil in incomplete film tend to accumulate), and of species, such as *A. vagus*, which tend to dispense with supports. Correlated with this there tends to be a difference of feeding habit between such as like to attach themselves to objects and those which more often than not swim freely. The former, anchoring at one spot, would seem to trust largely to chance to send them the necessities of life, either down current or wafted along the surface of the water by the wind. In this connection a definite tendency to collect all at one side was noticed in the case of larvae kept in bowls in the open, though its relationship to wind and to conditions of light was not investigated. The free-swimming larvae exhibit a more definite tendency to go in search of food. The larvae of *A. vagus*, for instance, were often watched repeatedly swimming slowly along the bottom moving their mouth-brushes and evidently feeding, in *Stegomyia* fashion. It is of interest that these small-pool breeders are among the more dominant varieties of Anophelines, for even so small an advantage of habit may be the factor accounting for their greater success compared with other species. The activity of the larvae of *Stegomyia* is certainly one of the factors which have resulted in the dominance of certain species. Those of *S. albopicta*, for instance, are far more active than those of any Anopheline. They are on the move constantly, either swimming at the surface and feeding on the surface material, often rotating as if the tail end was at a more or less fixed point; or groping at the bottom of water in receptacles, often of considerable depth, for food in the debris, into which they will often burrow so that their tails only can be seen. They can swim just as fish do in direct line, head first, altering their direction by a mere flick of the tail; they can rise or fall just as suits them without great effort; and, by reason of the greater flexibility of their bodies, they can wriggle violently in all directions so as to escape their enemies.

So it seems likely that the dominance among Anophelines of *A. vagus*, for instance, may be related to similar characteristics.

A surprising lack of wariness was exhibited by the young larvae of all the species of Anophelines. It was possible gradually to advance a spoon in the water and remove numbers at a time in their first and second ecdyses. But as the larvae became older, so they became more and more alert, until in the last ecdysis it was difficult to secure any, and with some species, *A. ludlowi* and *A. subpictus* var. *malayensis* in particular, almost an impossibility. The larvae in some families were more alert than in others of the same species, an indication possibly of a better state of health, and for this reason it was difficult to arrive at any definite conclusions as to the relative wariness of the different species. With *A. ludlowi* and *A. subpictus* var. *malayensis* a rapid advance towards the basins containing them was detected instantly, the larvae diving at once, so that on arrival not a single one was to be seen at the surface. All would be resting

at the bottom, usually ventral surface uppermost with the "tail" at an angle of 45 degrees to the body, an attitude often seen in dead larvae, whereby it would almost appear that they might be hoping to deceive enemies in search of them. It was noted that a family of larvae of *A. hyrcanus* var. *paeditaeniatu*s were particularly wary, remaining under the turbid water so long (some for two minutes) that it would have been easy for any inexperienced passer-by to doubt their existence even in bowls. The larvae of *A. barbirostris* seemed to be less alert than these until a rather later age, but were yet quite wary in the last moult. A little experience with a family of these will probably be always remembered by the writer. There had been at first considerable difficulty in breeding the species, most of the larvae in families dying off and only a few attaining maturity. Trial with a new food material seemed to afford promise of far better results, for out of a very large family of half-grown larvae none had died for days, and all were active. It was with no small dismay, therefore, that on approaching the basins containing them, a day or two before the expected pupations, many were seen, lying at the bottom in various position of distortion and upside-down. At each previous inspection all had been quietly feeding at the surface, and it was felt that those at the bottom must be dead, for no movement at all was made. However, on an attempt to move them, the apparently dead larvae scuttled off elsewhere with great activity.

The alarm manifested by the larvae would seem to suggest that their instinct had apprised them of menace both from above and from the water itself; indeed, the polymorphism of species (*A. hyrcanus* and *A. barbirostris* in particular) breeding by preference in large open sheets of water, affording many varied conditions of environment (to which the variations both of colour and pattern are due, in part at all events—as some experiments by the writer, as yet unpublished, have shown) would seem to suggest constant attack from above. From lack of opportunity the nature of this attack was not, unfortunately, enquired into very fully; but Anthomyiid flies of the genus *Lispa*, described by Atkinson in Hong Kong and by the writer in Nyasaland as attacking Culicid larvae, were present often in very great abundance on the water at its edge, and may well take some toll of the Anopheline larvae. Furthermore, particular dragonflies were seen frequently stooping over the water, head down, as if at some prey on the surface. It is not beyond the powers of dragonflies to take creeping insects (the writer has repeatedly watched a particular species in Nyasaland catching ants), and so these may well be among the agents which cause the larvae of Anophelines to feel apprehension.

Other Natural Enemies of Larvae.

It is said that the larvae of Anophelines do not as a rule coexist in breeding-places with those of CHIRONOMIDAE. This is true of small muddy pools in the Malay States, in some of which the CHIRONOMIDAE larvae exist in enormous numbers. So far as could be ascertained their influence on the Anophelines is indirect only; for, in basins, the Chironomids collected up all the floating algae with such assiduity, for the purpose of forming their larva cases, that the Anophelines soon became reduced to the verge of starvation. No direct attack was ever seen.

In certain ponds in which no Anopheline larvae were ever found in the course of searches made between April and July, certain predacious insects existed in great numbers, particularly the larvae of Neuroptera, which were never bred out (but were not those of dragonflies), and some BELOSTOMATIDAE, the females of which were frequently seen with masses of ova on their elytra. The Neuroptera in particular were highly predacious, devouring each other when confined in basins, even though supplied with ample other food material in the shape of Culicid larvae.

The writer has to acknowledge his obligation to the most efficient staff, trained by Dr. H. P. Hacker, the officer in charge of the Malaria Bureau, and particularly to Mr. Daniel Rajamoney and Mr. M. C. Chuen, for their untiring enthusiasm and patience in carrying out the details of the tedious breeding experiments.

FURTHER NOTES ON THE TABANIDAE OF PALESTINE, WITH DESCRIPTIONS OF NEW SPECIES.

By Major E. E. AUSTEN, D.S.O.

During the two years that have elapsed since the publication by the writer of a previous paper on Palestine TABANIDAE,* a small amount of material belonging to this family has been received from the same country. With one exception, for the Diptera in question—which, though few in number, present several points of interest, besides including representatives of two new species—the National Collection is indebted to the kindness of either Mr. P. A. Buxton or Mr. I. Aharoni.

The types of the new species, as well as the other specimens referred to below, are in the British Museum (Natural History).

PANGONIINAE.

Genus *Chrysops*, Meigen.

As stated by the author in his former paper (*loc. cit.*, p. 278), the only member of this genus met with by him from Deir el Belah to Haifa, during upwards of 18 months' service in Palestine in 1917–18, was *Chrysops punctifera*, Lw. Mr. Buxton is therefore heartily to be congratulated upon the discovery of the species described below.

***Chrysops buxtoni*, sp. n.** (figs. 1, 2, 3).

♂ ♀.—Length, ♂ (four specimens) 8.5 to 9.4 mm., ♀ (four specimens) 7.75 to 8.75 mm.; width of head, ♂ 3.5 to 3.75 mm., ♀ 3 to just under 3.5 mm.; ♂, eyes meeting in centre of top of head for a distance of about 0.5 mm.; ♀, width of front at vertex 1.25 to just under 1.5 mm.; length of wing, ♂ 7.6 to just under 8 mm., ♀ 6.75 to 7.2 mm.

Medium-sized, stoutly built, thick-set species, with an unusually broad head in both sexes, with abdominal markings as shown in figs. 2 and 3, and in both sexes with wing-markings as in fig. 3; legs mainly black, front tibiae at base, and middle and hind tibiae except distal extremities ochraceous-tawny.†

Head in both sexes olive-buff pollinose or pale olive-buff pollinose, clothed with fine hair of similar colour, which on face and jowls of ♂ is especially dense and long; ocelligerous tubercle in ♂ black, large, swollen and prominent, thinly covered with greyish pollen, and clothed in front with fine black or blackish hair; apex of frontal triangle in same sex shining black, in certain specimens occupied by a minute ovate or elongate ovate tubercle, which sometimes has an elongate depression in its upper extremity; face and jowls in ♂ uniformly pollinose, without shining tubercles or other areas; ♀ with a more or less shining black area (roughly triangular in shape, with prominent, rounded angles) surrounding the ocelli, and in well-preserved specimens not connected with the eyes, though traces of a black transverse band uniting it to the eye on each side are sometimes visible; *frontal callus* in ♀ shining

* Cf. E. E. Austen, "A Contribution to Knowledge of the Tabanidae of Palestine": Bull. Ent. Res. x, pp. 277–321, figs. 1–18 (April 1920).

† For names and illustrations of colours used for descriptive purposes in the present paper see Ridgway, "Color Standards and Color Nomenclature" (Washington, D.C. Published by the Author, 1912.)

black, transversely elongate and more or less elliptical in outline, its transverse diameter from two and a half to three times the length of the other; face in ♀ with a pair of elongate (often roughly pyriform), shining black *facial tubercles*; jowls in same sex uniformly pollinose; *eyes* in ♂ conspicuously transversely elongate, nearly twice as wide as deep, with area occupied by enlarged facets presenting a sharp colour-contrast to remainder (in dried specimens cinnamon-drab, drab-grey or smoke-grey, as opposed to purplish-black); eye-markings in ♀ resembling those exhibited by *Chrysops punctifera*, Lw., ♀,* but with the two lower spots on the inside in contact

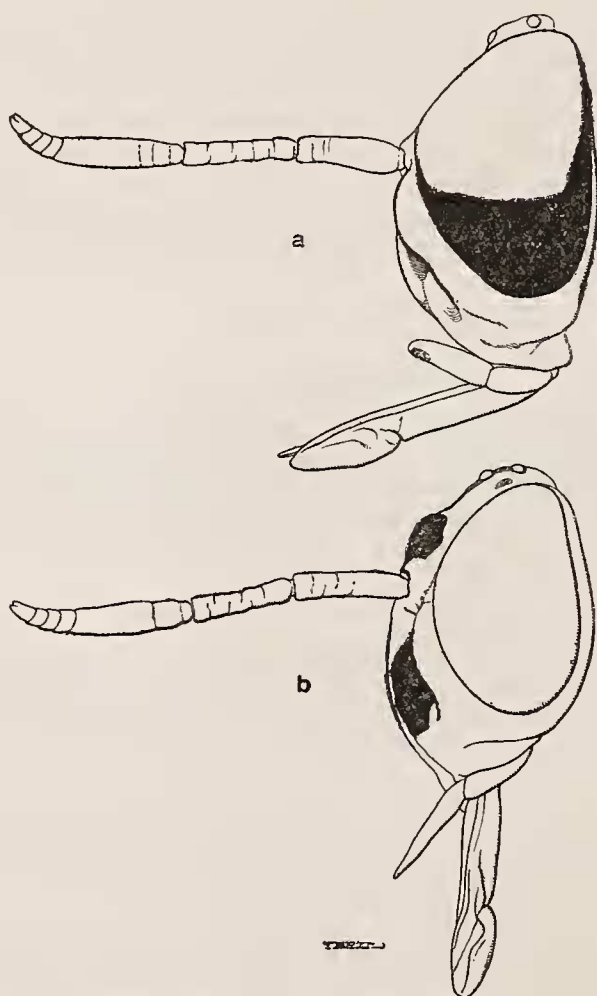


Fig. 1. Head of *Chrysops buxtoni*, Austen, in profile: a, ♂; b, ♀; ×10.

with the inner margin of the eye, and the uppermost spot not connected (at least in many cases) with the hind border; *palpi* in ♂ clothed with hair similar in character and coloration to that on jowls, proximal segment elongate, deep neutral grey, distal segment one-third as long again as proximal segment or longer, narrowing slightly distally but not tapering to a conspicuous point, ochraceous-buff, with dark brown elongate spot on outer surface just before the tip; proximal segment of *palpi* in ♀ neutral grey, clothed with hair like that on jowls, distal segment narrow, straight, conspicuously elongate, about two and a half times as long as proximal segment, partly dark brown or blackish-brown, partly pinkish-buff or cinnamon-buff, sparsely

* Cf. Austen, Bull. Ent. Res., x, pt. 3, p. 279, fig. 1 (April 1920).

clothed with minute, glistening pale yellowish hairs, and with some minute blackish hairs at extreme tip; *antennae* black, first segment in ♀ paler (cinnamon or pinkish-cinnamon) on proximal half or two-thirds, at least on inner side, first segment in ♂ somewhat thickened at base, but not noticeably incrassate, slightly greyish pollinose, and clothed with long hair of same kind and colour as that on face, second segment in ♂ clothed with minute black hairs and rather longer than first segment, third segment in ♂ about one-half longer than second; *antennae* in ♀ more slender than in ♂, first segment not at all incrassate, second segment approximately equal in length to first segment or rather shorter, third segment from one-third longer than, to nearly half as long again as first, latter clothed with short, glistening cream-buff hairs, mixed with black hairs above and towards distal extremity, second segment clothed with minute black hairs. *Thorax* (including scutellum) shining black above, in ♂ with a pair of faintly indicated, broad, admedian greyish stripes extending from anterior margin to region of transverse suture, in ♀ with a pair of well-defined, narrower, admedian, pale olive-grey longitudinal stripes, extending from anterior margin to prescutellar groove, where each stripe curves outwards to join corresponding lateral border, which, like anterior border and interspace between longitudinal stripes in front is light olive-grey pollinose; pleurae and pectus olive-grey or light olive-grey pollinose in both sexes; thorax in both sexes clothed with long, fine

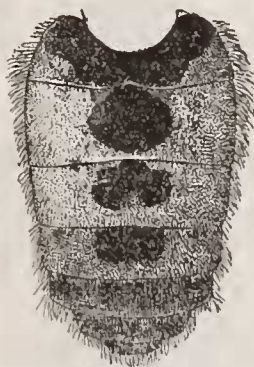


Fig. 2. Abdomen of *Chrysops buxtoni*, Austen, ♂, dorsal view; $\times 7$.

whitish or yellowish hair, particularly dense on pleurae, but in ♀ somewhat shorter above. *Abdomen*: upper surface (cf. figs. 2 and 3) mainly pinkish-buff or cream-buff in ♂, mainly black in ♀; first (visible) tergite in ♂, except posterior angles and a deep hind border on each side equal to about one-fourth of the breadth of the segment, shining black; second tergite in same sex with a large, shining black median spot, roughly circular in outline or irregularly quadrate with its posterior angles rounded off, resting on base, but not quite reaching hind margin, and on each side at base with a fainter (neutral grey) extension connecting it with hind margin of preceding segment; third tergite in ♂ with a large, roughly cordate median black spot, equal in width to spot on second segment, separated by a considerable interval from hind margin, but with its forwardly directed apex closer to or actually in contact with front margin; fourth tergite in ♂ with a median, basal black spot (most distinct when abdomen is viewed at a fairly low angle from behind), in shape resembling posterior half of spot on third segment, or sometimes looking like a pair of admedian triangles, separated by a greyish-olive, pollinose median triangle, base of which rests on hind margin; fifth and sixth tergites in ♂ greyish-olive or pale smoke-grey pollinose, with pinkish-buff hind borders, fifth tergite, at least when viewed at a fairly low angle from behind, usually exhibiting a pair of small, admedian, black triangles, resting on front margin; third and two following tergites in ♂, at least when viewed at a more or less low angle from behind, each exhibiting a median, forwardly directed,

greyish-olive or pale smoke-grey pollinose triangle, which in each case has its base resting on hind margin, while apex reaches anterior margin in case of triangle on fifth segment, though on fourth tergite triangle is confined to posterior two-thirds, while on third tergite triangle does not extend beyond half-way; venter in ♂ resembling dorsum, though median spots or blotches on first two (visible) sternites are fainter (neutral grey or deep neutral grey pollinose), while those on the three following sternites are transversely oblong, and last three sternites (except, in case of penultimate and antepenultimate sternites, hind borders and median transverse blotches) are iron-grey; abdomen in ♂ clothed mainly with whitish or yellowish (cream-buff or cream-coloured) hair, longer and finer on lateral borders, some of the dark spots, especially on ventral surface, covered mainly or partly with black or blackish hair; dorsum in ♀ (see fig. 3) with a cream-buff or cream-coloured transverse band (deep at each lateral extremity, but very narrow in middle, and with deeply sinuous, bilaterally

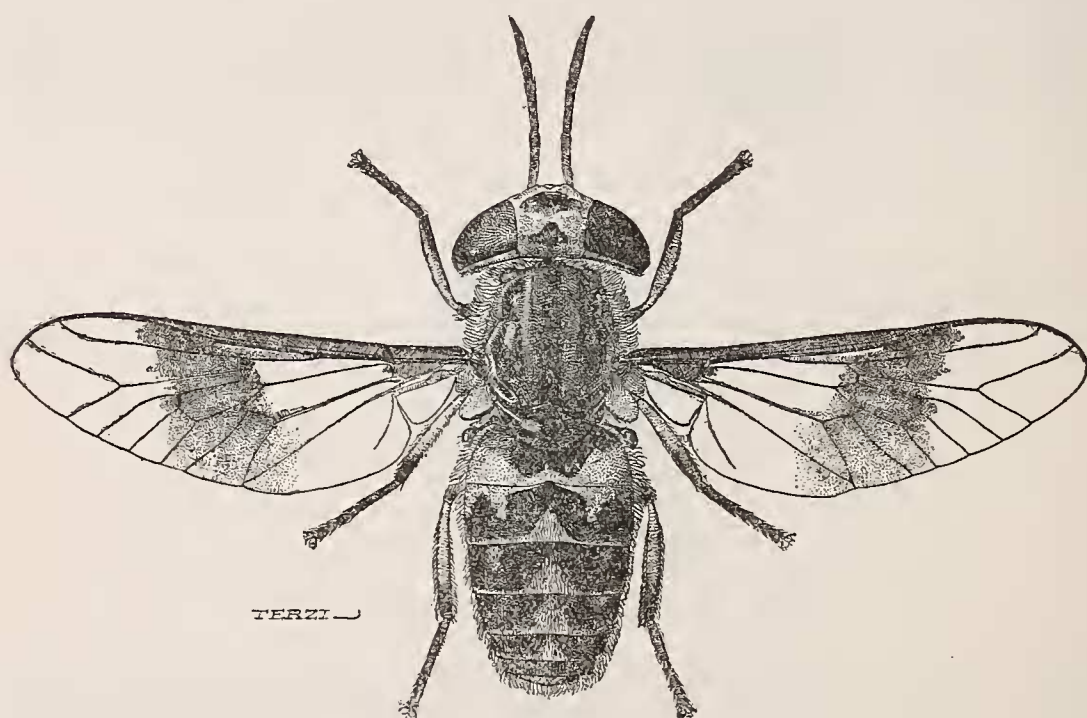


Fig. 3. *Chrysops buxtoni*, Austen, ♀; ×7.

symmetrical anterior and posterior margins) occupying hind border of first (visible) segment and anterior border of second segment; second and three following tergites in ♀ each with a median, forwardly directed, light brownish-olive pollinose triangle resting on hind margin, these triangles varying in size in different individuals; while in some cases all the triangles are small, in others the three hindmost are large, the apex in each instance almost, if not quite, reaching the hind margin of the segment in front; third and two following tergites each with a more or less distinct, light brownish-olive pollinose, elongate mark between median triangle and lateral margin on each side; sixth and seventh tergites in ♀ and hind borders of the four preceding segments light brownish-olive pollinose, sixth tergite sometimes with a pair of small, admedian black flecks on fore border; extreme lateral margins of first five (visible) tergites in ♀ smoke-grey or pale smoke-grey pollinose; venter in ♀ mainly brownish-black, moderately shining, lateral extremities of each sternite (sometimes as much as lateral thirds in case of first four visible sternites), and hind margins or hind borders of second and following sternites light greyish-olive pollinose;

abdomen in ♀ clothed on black areas with minute black hairs, otherwise clothed with short, appressed, glistening cream-buff hair. *Wings* in both sexes with blackish-brown markings as shown in fig. 3; blackish-brown costal border not extending beyond end of first longitudinal vein; basal cells, except their extreme distal extremities and a small, blackish-brown fleck at base of second basal cell, entirely clear; transverse band dying away in base of fifth posterior cell and apex of anal cell, without distinctly reaching hind margin; discal cell either entirely blackish-brown, or exhibiting a more or less well-defined, hyaline or semi-hyaline, longitudinal streak; anal cell closed shortly before (occasionally on) wing-margin. *Squamæ* in both sexes light isabella-coloured, with cream-buff borders. *Halteres* blackish-brown. *Legs*: tibiae not incrassate in either sex; coxae olive-grey pollinose, clothed with whitish hair; femora entirely black, more or less greyish (neutral grey) pollinose, clothed with whitish hair, except distal halves of front pair, which are covered with black or blackish hair; proximal halves or two-thirds of middle and hind tibiae clothed with glistening Naples yellow hair, which, especially in ♂, forms a conspicuous fringe on inner and outer surfaces of hind pair, the fringe towards the distal extremities gradually changing to black hair; tibiae otherwise clothed with black hair, with exception of a few minute, glistening Naples yellow hairs at extreme base of extensor surfaces of front pair; tarsi clothed with minute black hairs, first segment of middle and hind pair ochraceous-tawny (or cinnamon-rufous) at base, tarsi otherwise black.

Zikron Jakob and Khedeira (both in coastal zone—*P. A. Buxton*).

Type of ♂ and two paratypes belonging to the same sex, Zikron Jakob, 17.v.1921; type of ♀, one ♂ and three ♀ paratypes (one of the latter taken "on horse's neck"), Khedeira, 30–31.v.1921.

The fine species just described, to associate which with the name of its discoverer affords much pleasure to the author, is allied to *Chrysops hamata*, Lw., the typical specimens of which were taken by its describer near Makri, on the south-west coast of Asia Minor. *C. buxtoni*, however, differs from the species mentioned, *inter alia*, in the smaller size of the ocellar callus in the ♀; in details concerning the abdominal markings in both sexes; and in the transverse band on the wing in both ♂ and ♀ being much more sharply defined, and by no means consisting simply of an "edging to the transverse veins," as is stated by Loew to be the case in *C. hamata*. In the latter connection it may be of interest to state that, in the case of one of the ♀ paratypes of *C. buxtoni*, while the left wing is perfectly normal, the other has the transverse band reduced to a narrow streak traversing the tips of the basal cells and the proximal extremity of the discal cell.

***Chrysops punctifera*, Lw.**

For this species, which, owing to its having a sharply defined, clear "window-pane" in the discal cell, is placed by Kröber in his Group *Heterochrysops*,* the following are additional localities, etc.:—

One ♀, Zikron Jakob, 17.v.1921 (*P. A. Buxton*); one ♀, Zahlé, Lebanon, 20.v.1917, one ♂, same locality, 2.viii.1918 (*I. Aharoni*). Two ♂♂ and two ♀♀ of this species—the latter on a horse—were also taken by Mr. Buxton at Haifa, 20–28.v.1921.

TABANINAE.

Genus ***Haematopota***, Meigen.

In the paper published by the author in 1920, it was shown that the material belonging to this genus obtained by him in Palestine seemed to represent four species, all of which were apparently new. The data referring to additional specimens of two of these species, received during the past twelve months, are recorded below.

* Cf. O. Kröber, "Die Chrysops-Arten der paläarktischen Region nebst den Arten der angrenzenden Gebiete": Zool. Jahrb., Abt. f. Syst., xliii, pp. 42, 50, 56, 60, Taf. 2, figs. 63–65 (1920).

Haematopota sewelli, Austen.

Haematopota sewelli, Austen, Bull. Ent. Res., x, p. 281, figs. 2, 3 (April 1920).

Two ♂♂, Wadi Hamam, Galilee, 7.iv.1922 (*P. A. Buxton*); one ♂, Nahr Rubin (coastal zone), 25.iv.1921 (*I. Aharoni*); eleven ♀♀, Khedeira (coastal zone), 30.v.1921 (*P. A. Buxton*).

Haematopota innominata, Austen.

Haematopota innominata, Austen, Bull. Ent. Res., x, p. 290, fig. 4, c (April 1920).

One ♀, Khedeira (coastal zone), 30.v.1921, and nine ♀♀, Akka (coastal zone), 10.vi.1921 (*P. A. Buxton*).

Genus **Tabanus**, Linn.

In the author's previous paper, to which reference has already been made, 16 species of *Tabanus* were included. Two additions—*T. agnitionalis*, sp. n., and *T. (Ochrops) kertészi*, Szil.—to the list of these are made in the following pages, so that the total number of species of *Tabanus* now known to occur in Palestine is raised to 18.

Tabanus agnitionalis, sp. n. (fig. 4).

♀.—Length (one specimen) 15.5 mm.; width of head 5 mm.; width of front at vertex 0.8 mm.; length of wing 13.6 mm.

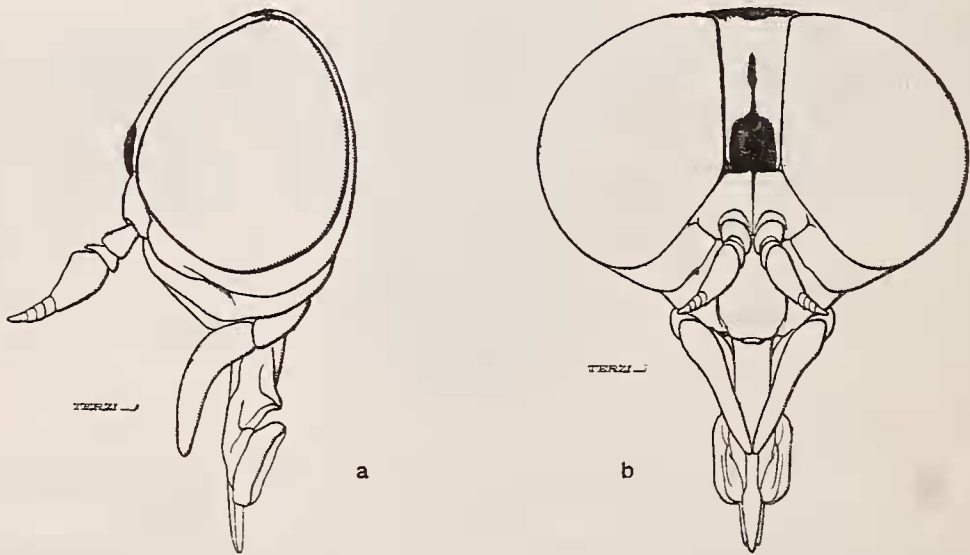


Fig. 4. Head of *Tabanus agnitionalis*, Austen, ♀ : a, lateral view ; b, viewed from in front ; $\times 10$.

Hairy-eyed, medium-sized species, with large, shining, cinnamon-brown lower frontal callus in ♀; dorsum of thorax dark neutral grey, conspicuously striped (except scutellum) with lighter grey; dorsum of abdomen beyond first (visible) segment for most part cinnamon-buff, but having the last three segments mainly infuscated—deep greyish-olive pollinose, and a large, quadrate median blotch of same colour on each segment from second to fourth inclusive; legs, except coxae, trochanters, extreme bases of femora and at least distal extremities of tarsi, cinnamon-coloured.

Head : front in ♀ deep olive-buff pollinose (slightly darker—light brownish-olive—in region of upper callus), densely clothed above and at sides of upper portion of lower callus with short, glistening Naples yellow hair, which towards vertex becomes longer, paler and sparser; subcallus in ♀, face, jowls and occiput smoke-grey